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COMPLETE SPECIFICATION

Improvements in or relating to a Beverage Mixing Device

We, SPACARB, INC., a corporation organised under the laws of the State of Delaware, United States of America, of 311—317, East 23rd Street, New York, State of New York, United States of America (Assignees of REGIS EDWIN PARKS), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a beverage mixing device, and is particularly adapted for mixing carbonated water and flavored liquids in the dispensing of soft drinks.

The present invention has for an object the provision of an improved beverage mixing device and one which is particularly adaptable to the mixing and dispensing of soft drinks such as, for instance, in the mixing of carbonated water and syrups prior to delivery in a cup or otherwise to a customer. Another object is the provision of a carbonated beverage mixing device which preserves to the maximum the carbonation of water in the mixed drink, thus providing for the delivery of a sharp and tangy drink as against a flat one in which a large amount of the carbonation has escaped from the drink. Still another object is the provision of a relatively simple and economical mixing device, and one which is easy to disassemble and clean and to reassemble. The invention further provides a beverage mixing device which is sanitary and free of self-contamination, which feature renders the invention particularly adaptable to use with multiple flavor drink vending, preventing the unintentional mixing of flavors in a single drink.

Although of wide general application, the beverage mixing device or assembly of the present invention will be found to be particularly valuable when used with automatic soft drink vending machines such as are presently finding wide public use. Such drink vending machines are ordinarily provided with means for automatically dispensing carbonated water and flavored syrup in measured amounts mixed as a carbonated beverage upon actuation of the machine by a customer or operator, and they are frequently constructed so as to dispense two or more flavors of drinks, or combinations of them.

According to the invention there is provided a beverage mixing device including means for discharging a stream of liquid and adjacent means for discharging a separate stream of liquid, said means being so arranged that said streams will converge beyond the confines of either of said means, said device comprising a downwardly directed carbonated water conduit, an inlead conduit communicating through a side wall of said water conduit, the axes of the bores of said conduits being offset with respect to each other and one or more syrup conduits arranged to have outlets distributed about the outlet of said water conduit, said syrup conduit or conduits having their outlets inclined to direct syrup toward the stream from the water conduit outlet.

In order that the invention may be clearly understood, it will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a view, partly in side elevation and partly in vertical section of a typical and illustrative embodiment of the invention;

Fig. 2 is a view, partly in section and partly in elevation, taken along line 2—2 of Fig. 1; and

Fig. 3 is a cross-sectional view taken along line 3—3 of Fig. 2.

The illustrative embodiment of the invention herein shown and described by way of example is adapted to use with automatic soft drink vending machines. Referring in detail to the drawings herein, a three flavor drink mixing device or head is shown wherein syrup is delivered in

measured quantities under pressure from other portions of an automatic mechanism (not shown) to the syrup tubes 10, 11 and 12 for mixture with refrigerated carbonated water also delivered under pressure in measured quantities to a water tube 13. Syrup from one or more of the tubes 10, 11 and 12 is mixed by means of the device of the invention with carbonated water from tube 13 in a descending stream and delivered, for example, in a cup 14 positioned beneath the device.

The carbonated water tube 13 leading from a carbonation apparatus or reservoir leads into an inlet tube 15 of somewhat larger diameter than tube 13, and the inlet tube 15 in turn conducts the water to a head member 16 having a cylindrical bore 17 and lower open end indicated by the numeral 18. The bore 17 of the head member 16 is, as shown, of substantially greater diameter than the inlet tube 15, and the latter enters the former through a port 19 in which the end of the tube 15 is fixed. As best shown in Fig. 3 of the drawings, port 19 is so arranged in head member 16 that carbonated water entering from tube 15 is not projected across the bore 17 to engage the opposite wall and continue in a turbulent flow, but is tangentially delivered within the bore 17 so that further flow of the water is in a swirling or spiral path around and down the wall of bore 17 toward the open end 18. For this purpose, the port 19 is eccentrically arranged with respect to the head 16, so that the radially outermost components of the water stream entering bore 17 do so substantially along a tangent to said bore. As can be seen from Fig. 3 of the drawings, a portion of the wall of tube 15 constitutes a tangent to the lateral wall of bore 17. The internal diameter of tube 15 is preferably not greater than the radius of bore 17.

The lower end of the head member 16 is externally threaded, as indicated at 20, to receive a nozzle member 21, the upper end of the bore 22 of which is correspondingly threaded. The nozzle member 21 may, if desired, be made of a plastic or similarly translucent or transparent material. A shoulder 23 is provided in the bore 22 of the nozzle member which serves as a seat for a circular screen element 24 or other means for counteracting or lessening the spiral swirl of carbonated water as it travels through the nozzle member. It will be noted that the nozzle 21 may be conveniently unscrewed from the head 16 and inverted to take out screen element 24 in order to clean the parts.

The bore 22 of nozzle member 21 is reduced and frusto-conically shaped at 25 in its portion below the shoulder 23 and adjacent the outlet end thereof, forming an integral and converging stream of carbonated water, as indicated at 26, for mixture with syrup and delivery into the cup 14. With the construction for the carbonated water transmission and discharge system shown and described it will be apparent that the minimum of carbonation is lost prior to mixing with the syrup to form the beverage. The velocity of the water stream becomes progressively less as it passes from more restricted to less restricted conduits, passing from tube 13 into inlet tube 15, from there into the head member 16, and thence into the nozzle member 21. Moreover, the water, at reduced velocity, proceeds into and through the head member 16 and into the nozzle 21 in a spiral path with a minimum of turbulence and, consequently, little loss of carbonation. The discharge of water in such a path would, however, be troublesome in mixing with the syrup and falling into the cup 14, so that means in the form of screen element 24 and reduced portion 25 of the nozzle are utilized to reduce or remove the spiral pattern of flow and focus and integrate the stream immediately before delivery.

A plate member 30 secured to any stationary portion of a drink machine or other framework may conveniently comprise the mounting for the presently described mixing device. The plate member is provided with an arcuate relieved place to receive the head member 16 and the latter is firmly secured thereto, as by welding. A plurality of apertures 31 are provided around the head member 16 through respective ones of which the syrup tubes 10, 11 and 12 are passed. Said tubes are arranged about the nozzle member 21 and are slightly turned at their end portions 32 inwardly toward the axis of the nozzle, so that the streams 33 therefrom are directed toward the carbonated water stream 26 and adapted to meet and mix therewith beneath the nozzle 21. The ends 32 may be adjusted so that the streams 33 will meet and intermix with water stream 26 at any desired place, but it has been found desirable to arrange the streams so that they meet at a point at least as high as, or higher than, the upper surface of the completed, automatically dispensed drink, as shown in Fig. 1 of the drawings. Thus, mixing always takes place within the descending stream before the bottom of the cup or the drink therein is reached, providing a better mixture than if turbulence in the cup or drink alone were relied upon.

The outlet ends 35 of the syrup tubes 10, 11 and 12 are preferably reduced to focus and integrate the streams therefrom. It

will be apparent from the arrangement shown and described that the mixture of syrup and water takes place at all times outside of the water dispensing nozzle 21, so that there can never be any syrup contamination thereof. Thus, a drink flavor delivered from tube 10, for instance, can never be intermixed with a drink flavor immediately subsequently delivered from tube 11, for instance, and, moreover, any dripping or seepage from one or more of the syrup tubes between the dispensing of drinks will not affect a subsequently mixed drink.

The invention in its broader aspects is not limited to the specific mechanism shown and described, but departures may be made therefrom, within the scope of the accompanying claims.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A beverage mixing device including means for discharging a stream of liquid and adjacent means for discharging a separate stream of liquid, said means being so arranged that said streams will converge beyond the confines of either of said means, said device comprising a downwardly directed carbonated water conduit, an inlead conduit communicating through a side wall of said water conduit, the axes of the bores of said conduits being offset with respect to each other and one or more syrup conduits arranged to have outlets distributed about the outlet of said water conduit, said syrup conduit or conduits having their outlets inclined to direct syrup toward the stream from the water conduit outlet.

2. A beverage mixing device as claimed in claim 1, wherein said carbonated water conduit comprises an internally bored outlet member, first inlead conduit means of reduced bore cross section communicating with the bore of said outlet member, and other inlead conduit means of still further reduced bore cross section communicating with said first inlead conduit means.

3. A beverage mixing device as claimed in claim 2, wherein said outlet member communicates with a water inlead conduit, the axis of which is arranged at substantially a right angle with respect to and not intersecting the axis of said bore, said inlead conduit being preferably arranged to discharge a stream of water tangentially of said bore.

4. A beverage mixing device as claimed in claim 3, wherein a portion of a wall of said inlead conduit constitutes a tangent to the lateral wall of said bore and the internal diameter of said inlead conduit is not greater than the radius of said bore of said outlet member.

5. A device as claimed in any of the preceding claims, wherein a plate element is provided supporting the means or conduits for discharge of said separate streams.

6. A device as claimed in any of claims 2 to 5, wherein in said water outlet member means is provided for counteracting water swirl within said outlet.

7. A device as claimed in claim 6, wherein said swirl counteracting means is located in the bore of said outlet member adjacent the outlet end thereof.

8. A device as claimed in claim 6 or 7, wherein the interior of said outlet member is frusto-conically shaped adjacent its outlet and said swirl counteracting means is a screen supported above the frusto-conically shaped outlet.

9. A beverage mixing device constructed and arranged substantially as described and shown in the accompanying drawings.

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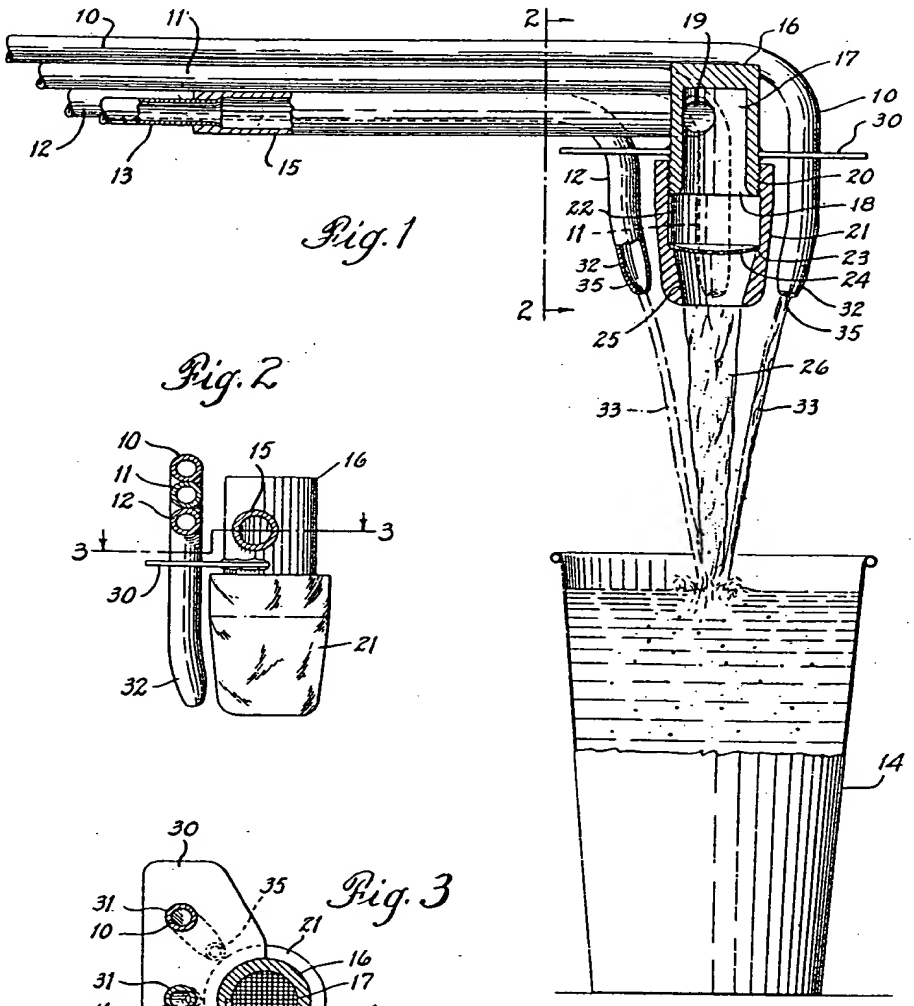

Fig. 1

Fig. 2

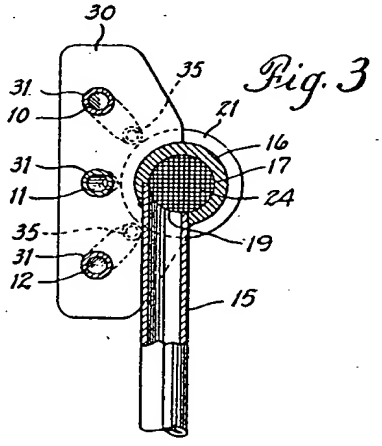

Fig. 3

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